

# Juhoon Kim

SKILLED PROGRAMMER · LARGE DATA ANALYST · INTERNET/NETWORK ARCHITECTURE EXPERT

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## Short Introduction

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I am a research scientist at Telekom Innovation Laboratories (An-Institute of TU Berlin) in Germany. My responsibilities and research interests include the development of network monitoring functions and the analysis of large amounts of network data. I am also working on several EU-funded projects which focus on new networking paradigms such as Software-defined Networking (SDN) and Network Function Virtualization (NFV). Previously, I received Ph.D. and M.Sc. degrees in Computer Science from TU Berlin. During my Ph.D. studies, my research activities were centered around developing and evaluating future Internet protocols and architectures such as IPv6, Locator/ID Separation Protocol (LISP), and Multi-source/Multi-interface data transmission.

## Education

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### Dr.-ing. (Ph.D.) in Computer Science

TU BERLIN (TECHNISCHE UNIVERSITÄT BERLIN)

Berlin, Germany

Apr. 2010 - Apr. 2014

- Thesis: "Towards Utilizing Network Diversity for Future Internet Protocols"
- Supervisors: Prof. Anja Feldmann (TU Berlin, Germany), Prof. Don Towsley (UMass Amherst, USA), Prof. Luigi Iannone (Telecom Paris-Tech, France), Dr. Ramin Khalili (Huawei Deutschland, Germany)

### Master of Science (M.Sc.) in Computer Science

TU BERLIN (TECHNISCHE UNIVERSITÄT BERLIN)

Berlin, Germany

Sep. 2006 - Mar. 2010

- Thesis: "eDonkey and Kad Traffic Analysis based on Semantic Protocol Identification"
- Supervisor: Prof. Anja Feldmann (TU Berlin, Germany)

### Bachelor of Engineering (B.Eng.) in Electronic Engineering

DONGSEO UNIVERSITY

Busan, S.Korea

Mar. 1995 - Feb. 2002

## Skills

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**Computer Networking** A broad knowledge of the Internet architecture and network protocols (e.g., HTTP, DNS, TCP/IP, etc)  
An extensive experience on network traffic analysis and monitoring  
A professional knowledge about new networking paradigms such as SDN and NFV

**Research Skills** A field practice of analyzing problems, finding solutions and evaluating outcomes  
A long experience in academic and industry publications  
A wide knowledge of data analysis and statistics

**Programming Skills** (main) C/C++, Bash, R, Perl, PHP  
(knowledgeable) Java, Ruby, JavaScript, Python, Scala  
<https://www.github.com/darcy95>

**Experienced Software** **Bro NIDS:** A framework for network monitoring and analysis  
**Network Tools:** Various network monitoring and verification tools such as tcpdump, nmap and netcat  
**Linux CLI tools:** A set of linux software used to process data  
**R:** A software and programming language for statistical computing and graphics  
**KVM & OpenStack:** A virtualization software (framework) of computing resources  
**LaTeX:** A typesetting software for producing high-quality scientific documents

**Dev Platforms** Linux (User/Kernel Level), MS Windows, Android, Web

**Language Skills** Korean (native proficiency)  
English (professional working proficiency)  
German (working proficiency)

## Professional Experience

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### Telekom Innovation Laboratories

RESEARCH ASSOCIATE

- Performed research on the new networking paradigms (i.e., 5G, SDN, NFV)
- Performed measurement and analysis on large-scale Internet traffic
- Performed research and development in EU-funded project consortiums

Berlin, Germany

Aug. 2014 - Present

### International Carrier Sales & Solutions, Deutsche Telekom

RESEARCH VISIT

- Performed Internet traffic measurement & analysis

Bonn, Germany

Aug. 2012 - Sep. 2012

### Softcan Inc.

RESEARCH & DEVELOPMENT

- Developed a content management system
- Re-developed and improved the security of outdated products

Seoul, S.Korea

Jan. 2003 - Oct. 2004

### Korea.com Communications Inc.

RESEARCH & DEVELOPMENT

- Developed a web search engine

Seoul, S.Korea

Nov. 2001 - Dec. 2002

## Projects

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### FP7 UNIFY

CO-FUNDED BY THE EUROPEAN COMMISSION DG CONNECT IN FP7

- UNIFY is a consortium of 16 European partners and aims at a full network service virtualization.
- My role in this project is to develop the IPTV quality monitor based on the standardized QoE assessment mechanism (ITU P.1201.2).

Aug. 2014 - Apr. 2016

### 5G-PPP 5GEx

CO-FUNDED BY 5G-PPP & HORIZON2020

- 5GEx is a consortium of 17 European partners and aims at enabling a unified 5G infrastructure service market.
- My role in this project is to develop a sandbox test-bed and use-case service for an experiment of the 5GEx architecture.

Oct. 2015 - Present

## Professional Services

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#### Proposal Reviewer of

- Horizon2020 MONROE (2016)
- French National Research Agency ANR (2013)

#### TPC Member of Reviewer of

- IEEE International Conference on Broadband and Photonics (2015)
- Cyber-enabled Distributed Computing and Knowledge Discovery Conference (2015)
- Elsevier Computer Networks (2011)
- Asian Internet Engineering Conference (2011)

## Teaching Experience

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#### MASTER/DIPLOM THESIS SUPERVISION

- Soumya Ranjan Parida, *What Web Objects are Delivered Through Hypergiants?*, 2016
- Karl Fischer, *Smart mHTTP: Chunk Scheduler Design and Implementation for the Multi-source Multipath HTTP*, 2015
- Matthias Siebke, *Analyse und Untersuchung des World-of-Warcraft-Netzwerkprotokolls*, 2011

#### TEACHING & SEMINAR ORGANIZATION

- Network Protocols and Architectures (WS13/14, WS12/13, WS11/12, WS10/11)
- Internet Routing Seminar (WS13/14, WS11/12, WS10/11)
- Internet Measurement Seminar (SS13)

#### INVITED LECTURES & TALKS

- A special lecture at Sungkyunkwan University, Korea, *An introduction to the new networking paradigm and related EU projects*, 2018
- A talk at Soongsil University, Korea, *An introduction to the NFV-related EU projects UNIFY & 5G Exchange*, 2018

# Publications

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## GiLAN Roaming: Roam Like at Home in a Multi-Provider NFV Environment

*Presented in Rome, Italy*

IEEE ISNCC'18 (THE INTERNATIONAL SYMPOSIUM ON NETWORKS, COMPUTERS AND COMMUNICATIONS)

2018

- The paper introduces a novel approach for localizing inter-domain roaming traffic in the visited network on a NFV environment where multiple service providers share their telecom infrastructure

## Realizing Services and Slices Across Multiple Operator Domains

*Presented in Taipei, Taiwan*

IEEE/IFIP NOMS'18 (NETWORK OPERATIONS AND MANAGEMENT SYMPOSIUM)

2018

- The paper introduces the framework of the 5G Exchange multi-domain NFV architecture

## DevOps for Software-Defined Telecom Infrastructure

*IETF Draft*

IETF DRAFT-UNIFY-NFVRG-DEVOPS-00, 01, 02

2015

- The draft identifies three areas that are essential to apply DevOps principles in a telecom service provider environment (i.e., monitoring, verification and troubleshooting)

## Service Provider DevOps for Large Scale Modern Network Services

*Presented in Ottawa, Canada*

IEEE BDIM'15 (BUSINESS-DRIVEN IT MANAGEMENT)

2015

- The paper debates DevOps requirements for developing a modern service creation platform

## Multi-Source Multi-Path HTTP (mHTTP): A Proposal

*Presented in Austin, TX, USA*

ACM SIGMETRICS'14

2014

- The paper introduces the design and implementation of mHTTP, which is a mechanism to establish simultaneous connections with multiple servers to fetch a single content
- **Related source code:** <https://www.github.com/darcy95/mhttp>

## Caching Locator/ID mappings: An Experimental Scalability Analysis and Its Implications

*Journal*

ELSEVIER COMPUTER NETWORKS

2012

- The article analyzes the implication of timeout policies of the Locator/ID Separation protocol based on real packet-level traces
- **Related source code:** <https://www.github.com/darcy95/lispcache-emulator>

## A Local Approach to Fast Failure Recovery of LISP Ingress Tunnel Routers

*Presented in Prague, Czech Republic*

IFIP NETWORKING'12

2012

- The paper proposes and evaluates a LISP router synchronization mechanism that aims at disruptionless traffic redirection

## A Deep Dive into the LISP Cache and What ISPs Should Know About It

*Presented in Valencia, Spain*

IFIP NETWORKING'11

2011

- The paper introduces the cache emulator of the Locator/ID Separation protocol and presents the implications of LISP deployment from ISP's perspective

## Revisiting Cacheability in Times of User Generated Content

*Presented in San Diego, CA, USA*

IEEE GLOBAL INTERNET SYMPOSIUM'10

2010

- The paper presents an analysis of cacheable network content transferred over various application protocols

## Today's Usenet Usage: Characterizing NNTP Traffic

*Presented in San Diego, CA, USA*

IEEE GLOBAL INTERNET SYMPOSIUM'10

2010

- The paper introduces the design and implementation of the NNTP (Network News Transfer Protocol) analyzer and presents the traffic behavior